

TechTalk

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Scientists patent Prozac use for PMS

By Sarah H. Wright
News Office

MIT scientists have patented the use of Prozac to treat the unsettling disturbances of mood, appetite and behavior associated with premenstrual syndrome (PMS).

The two scientists are Dr. Richard J. Wurtman, Cecil H. Green Distinguished Professor in the Department of Brain and Cognitive Sciences and director of the Clinical Research Center, and his wife, Dr. Judith Wurtman, a research scientist in the same department.

The Wurtmans are well known for developing Redux, a drug for the treatment of obesity. Richard Wurtman also developed Melzone, a melatonin product that aids sleep, and Judith Wurtman developed PMS Escape, a food-based beverage designed to manage carbohydrate cravings associated with PMS.

Melzone and PMS Escape are made and sold by InterNutria, a subsidiary of Interneuron Pharmaceuticals, Inc., of Lexington. Richard Wurtman is the scientific founder of Interneuron.

Since the Wurtmans' research on PMS was conducted at the Clinical Research Center, MIT holds the use patent for Prozac and related drugs to treat PMS. Through a sublicensing arrangement with MIT, Interneuron will grant Eli Lilly and Co., holder of the composition patent for Prozac, exclusive rights to use Prozac to treat PMS.

In exchange, Interneuron will receive upfront fees, milestone payments and royalties based on potential sales of Prozac in the United States to treat PMS. MIT will receive a portion of these payments from the Interneuron sublicense.

Prozac (fluoxetine hydrochloride), the world's most widely prescribed antidepressant drug, increases the available levels of the brain chemical serotonin.

The Wurtmans discovered that an apparent deficiency in brain serotonin may also cause individuals to suffer from unwanted weight gain, mood disorders and impulsivity.

People with carbohydrate-craving obesity, seasonal affective disorder (SAD) and PMS have serotonin, but it is "simply not enough or not active enough," Judith Wurtman said.

The symptoms of inadequate or insufficient serotonin levels in women during their late-luteal, or premenstrual, phase can become highly disruptive to normal functioning, she said.

"The major symptom--the symptom most upsetting to women--was anger. Anger directed at somebody else--their co-workers, families, children--was much more upsetting to them than, say, premenstrual depression. They reported depression was 'not so bad,'" Judith Wurtman said.

Other troubling symptoms of PMS included "worry they were losing their minds. They felt confused, clumsy, spacey and fatigued," she said.

Particularly besieged were women with PMS who were also dieting. "They'd lose weight in the first two weeks of a cycle--say, four or six pounds--then gain up to 10 pounds during the second two weeks of the cycle, thanks to craving high-calorie carbohydrates. Thinking 'next month it will be the same' made people feel hopeless," Judith Wurtman said.

The effect of Prozac on women who suffered from severe PMS was both directly and indirectly positive, she explained.

Its direct positive effects involved mood. "Serotonin gives a sense of vigor. It took away apathy, that blah feeling. It took away agitation, anxiety. It took away impulsivity and carbohydrate-eating binges. Women in the study could now recall things such as where they put their keys, whether they turned off the computer," she said. "It raised their self-confidence."

The indirect effects of using Prozac to treat PMS involved people such as colleagues, employees, and family members.

"It was good for the women and for their environment," Judith Wurtman said. "The use of Prozac goes beyond treating mood--it affects behavior, making women more in control of their impact on those around them. Women with demanding jobs--people who must meet others' expectations that they be reliable, steady and predictable--faced serious impairment with severe PMS symptoms. A female boss who praises her workers three weeks out of the month, then berates them when she has PMS, takes a tremendous toll on everyone in that workplace.

"A mother who is sometimes placid and sometimes a raving maniac makes a child wonder about the stability of his world," she said. "Prozac offers real utility where women need to have stability of judgment and behavior."

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